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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,868	03/30/2001	Kevin Horner-Richardson	TDTD 10465.1	9294
321	7590	03/24/2004	EXAMINER	
SENNIGER POWERS LEAVITT AND ROEDEL ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			PASCHALL, MARK H	
			ART UNIT	PAPER NUMBER
			3742	

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/821,868	HORNER-RICHARDSON ET AL.	
	Examiner	Art Unit	
	Mark H Paschall	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 60-65 is/are allowed.
- 6) ☒ Claim(s) 1-59, 66-69 and 71-74 is/are rejected.
- 7) ☐ Claim(s) 70 and 75 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u># statements</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

Claims 60-63 are objected to because of the following informalities: these claims set for a series of parts or exchangeable parts, electrodes for a plasma torch. Note that these claims should be defined as in claim 64, which defines a series of electrode and tip "sets (or a kit comprising) format. Just recitation of a series of parts could merely comprise extra or duplicate electrodes or tips for the torch. . Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-15,21-32,50-59, 66-69 and 71-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 084' in view of Jp 170'. Jp 084' teaches the claimed subject matter except for showing texturing of the electrode to enhance cooling. Jp 084 does teach texturing of the outer tip ;surface and the inner shield cap surface to effect cooling. The patent to JP 170' is applied for ;teaching that the outer electrode surface 8 can be axially grooved, spirally grooved or circumferentially grooved to enhance the cooling and longevity of the torch components. In view of this teaching it would have been obvious to modify the Jp 084' system to include texturing of the electrode in addition to the shield cap and tip, so that the benefit of enhanced cooling of the torch parts would; be effected. Note that grooves and ribs and projections are set forth in the applied patents to increase the hydrodynamic or turbulent gas flow and hence the cooling effect, and it is considered a matter of design to use dimples or other surface texturing designs to also effect a turbulent flow, since many patterns are available which would disturb or turbulate such flow effectively. Use of spirals counter and against the gas flow direction is set forth in the applied patents. Use of a specific pitch to such spiral is considered a routine choice in design for the artisan , dependent on the cooling characteristics desired.

Claims 16-20 and 45-49 rejected under 35 U.S.C. 103(a) as being unpatentable over Jp 084' in view of Jp 170 as applied to claims set forth above, and further in view of Luo et al 040'. Jp 084 as modified teaches the claimed subject matter except for showing texturing of the inner tip of the torch to enhance the cooking. However, as set

forth in the patent to Luo et al it is conventional to provide the inner surface of tip 102 with texturing effects to enhance operation and cooling of the same and in view of this teaching it would have been obvious to modify the Jp 084' system further to include the same since the benefit of enhanced cooling would be attained for the torch.

Claims 33-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jp 084' in view of Jp 170' as set forth above further in view of Stuart et al. In view of Stuart et al teaching an easier changeability of the electrode using an threadless connection or a detent means 257,260, it would have been obvious to modify the Jp 084' system further to include the same, to make changing of the torch electrode less time consuming and more effective.

\Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Luo et al 415' Cook et al are cited for disclosing textured plasma torch components.

Allowable Subject Matter

Claims 60-65 are allowed. These claims set forth use of current level choice and use of surface are variation of the electrode in response to different current levels, such not being taught in the prior art of record.

Claims 70 and 75 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims define the step of variation of the current level in the torch in response to surface area change of the parts, such not being taught in the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark H Paschall whose telephone number is 703 308-1642. The examiner can normally be reached on 7am - 3pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on 703 308-2634. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark H Paschall

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Primary Examiner
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A handwritten signature in black ink, appearing to read "M. R. Pan", written in a cursive style.